

OBSERVATIONS ON THE EUCALYPTS OF NEW
SOUTH WALES.

PART IV.

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(Plates XXIX.-XXXIII.)

EUCALYPTUS PIPERITA, Sm.

Vernacular names.—"Peppermint" is its usual name about Port Jackson and in some other districts. It goes by the name of "Messmate" in some other parts of the colony. It has been called "Almond-leaved Stringybark" and sometimes "White Stringybark." Through confusion with *E. pilularis* (to which it is often not dissimilar in general appearance) it is sometimes known as "Blackbutt," but such names as Stringybark and Blackbutt as applied to this species should be discouraged.

Bark.—Sub-fibrous on the trunk, with smooth branches.

Timber.—Pale-coloured, with gum-veins, deficient in strength and durability and only used in default of better timber.

Seedling leaves.—Ovate, $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long and over by about half the breadth. Usually paler on the under side. As growth progresses the leaves increase in size and become oblique and more acuminate.

Mature leaves.—Very oblique, more or less falcate and acuminate. In the *Flora Australiensis* it is stated that the leaves are rarely above 1 inch long, but this appears to us a mere typographical error as we have seen specimens with far longer leaves which were examined by Bentham himself, and leaves 5 or 6 inches long are common. The venation is oblique, as shown in the drawing.

Buds.—Through the puncture of insects the calyx-tube is sometimes swollen while the operculum is unaffected, giving the latter, by comparison, a decidedly rostrate appearance. Sometimes the

operculum is markedly pale-coloured in this species; this is accentuated in dried specimens.

Fruit.—The fruits may be arranged under three forms, which pass into one another:—

(a) Urceolate.

(b) Egg-shaped.

(c) Nearly spherical, open-mouthed.

(a) Urceolate.—This is the commonest Port Jackson form and must, we think, be regarded as the type. It is probably the form corresponding to the leaves secured by White. The variety is found in the Blue Mountains, Goulburn, Braidwood, Moruya, and throughout the range of the species generally.

(b) Egg-shaped.—The range of this form is probably co-extensive with the species. We have egg-shaped fruits from Port Jackson, the Blue Mountains and the Mudgee district, and south to Thirlmere, Picton to Bargo and Ulladulla.

(c) Nearly spherical.—These occur at Manly, Port Jackson, and some other places elsewhere in this colony. Some of Mr. Howitt's Gippsland specimens in our opinion also fall under this group. The fruits are very small, not exceeding 2 lines in diameter.

This form may readily be confused with *E. amygdalina* var. *radiata* if individual fruits be alone examined, but the leaves of the latter are much narrower, are thinner, duller, full of oil-dots (the leaves reek with oil) and the twigs are rusty-tuberculate.

We have been favoured by Mr. J. G. Luehmann with a view of specimens of *E. piperita* collected by Robert Brown, Iter Australiense, 1802-5 (distributed by J. J. Bennett, British Museum, in 1876). The specimens are stated to be from Port Jackson (? by Brown), but we would point out that in the early days collections marked Port Jackson frequently came from considerable distances north, south and west of that estuary. Robert Brown's specimens have fruits most of which come under our group (c); at the same time others approach (b) in shape.

In the *Flora Australiensis*, iii. p. 207, we find mentioned var. *laxiflora*, Benth. "Pedicels rather long. Fruit more obovoid,

the rim more depressed. Manly Beach, Twofold Bay, Camden, Macleay and Clarence." We have been trying to ascertain what this so-called variety really is. No specimens are so labelled in the Melbourne National Herbarium, although the latter contains specimens from the Macleay and Clarence. These we refer to (*infra*, p. 786). Specimens from the other localities mentioned do not, in our opinion, answer satisfactorily to Bentham's brief description, and the name might well be disregarded.

In 1879 Mr. A. W. Howitt sent to Baron von Mueller from Walhalla, Gippsland, specimens with the following note: "Tree locally known as Stringybark; the specimen is taken from a tree split for palings, and I am informed that the wood is sound and durable and both saws and splits well." The Baron labelled these specimens "*E. eugenoides*, Sieb.," and also "*E. piperita*, Sm., var. *eugenoides*." Some identical specimens sent by Mr. Howitt from the Tambo River were labelled by the Baron "*E. eugenoides*, Sieb.," and he adds, "To this the specific name *E. pilularis* would well apply."

E. piperita and *E. eugenoides*.—In the *Flora Australiensis* *E. eugenoides* is reduced to a variety of *E. piperita*, and even in the *Eucalyptographia* the Baron almost expresses doubts as to whether finally Bentham's opinion that both should be regarded as forms of one species may not have to be adopted. This view is not, however, held by New South Wales botanists. A comparison of the two types as they occur near Sydney must convince the most incredulous as to the distinctness of the two species. Nevertheless there are certain forms which judging from herbarium specimens or fruits alone, appear to stand half-way.

The seedling twig depicted on the plate of *E. piperita* in the *Eucalyptographia* belongs to *E. eugenoides*, as pointed out by Mueller himself; it further appears to us that the twig bearing buds, flowers and fruit more correctly represents *E. eugenoides* than *E. piperita*.

It is clear on reading the Baron's description in the text that he has not had any typical New South Wales specimens in his mind, for he describes *E. piperita* as having both "stem and

branches covered with fibrous outside grey and rough bark," and he mentions as one of the means of distinguishing it from *E. pilularis* "its rough bark extending to the branches (Pachyphloie)," whereas the typical *E. piperita* is only a "half barked" tree like *E. pilularis*.

Howitt in his "Eucalypts of Gippsland" (*Trans. R.S. Vict.* Vol. ii. Part 1, p. 87) speaks of the "near alliance" of the two species. Speaking generally, the two species are very distinct and are not to be mistaken one for the other. They differ markedly in their seedlings, in the venation of the mature leaves and in the odour of the same in their bark and timbers.

Howitt has figured a number of fruits at Plate 13 which he attributes to *E. piperita*, viz., Nos. 6-19, Nos. 20 and 21 being referred to *E. eugenioides*. We are of opinion that Nos. 6 to 9 are properly referred to *E. piperita*; as regards the remainder, we would suggest that they probably belong to *E. eugenioides*. We would also invite attention to Mr. Howitt's excellent drawings of seedlings on Plate 14. Nos. 1 and 4 seem to us both to belong to identical species, viz., *E. eugenioides*.

It does not appear to us that Howitt has quite grasped the distinction between *E. piperita* and *E. eugenioides*, which opinion is strengthened by a consideration of the apparent confusion existing in the mind of Baron von Mueller when writing the descriptions of the two species in the *Eucalyptographia*. Nevertheless the southern examples especially do present some difficulties, and there is a form of somewhat wide distribution which we shall now refer to which, if not a connecting link, shows at any rate affinity to both species, and it may have been a predominance of such a form which led to so much confusion.

The intermediate form to which we refer may be briefly indicated as follows:—Bark fibrous, not so fibrous as that of a typical Stringybark, and perhaps little more fibrous than that of the ordinary *E. piperita*. The fruits nearly globular and showing a mottled appearance, due to unequal shrinkage of the outer layers of cells of the fruit. The orifice is small, the rim depressed and not very prominent. The specimens, which are from Port

Jackson, precisely match some labelled in Baron von Mueller's handwriting "Stringybark, *E. piperita*, Twofold Bay." The fruits figured in the *Eucalyptographia* are not very dissimilar to them. They have short pedicels and are frequently sessile. We cannot ascertain that this form has been named as a variety. The tree appears to us to partake of some of the characters of both *E. piperita* and *E. eugenioides*. The Port Jackson-Twofold Bay specimens may for convenience be referred to as A. The texture of the leaves of A and the prominence of the veins are intermediate between *E. piperita* and *E. eugenioides*, as is also the amount of essential oil so characteristic of *E. piperita*. The fruits of *E. piperita* have a very thin rim, in A it is a little broader, in *E. eugenioides* it is well defined. The size of the orifice of A is intermediate between the two species named. The shape of the fruits of A is less ovoid than those of *E. piperita*, and less hemispherical than those of *E. eugenioides*.

Since the above was written Mr. J. G. Luehmann, Curator of the Melbourne National Herbarium, has favoured us with some specimens collected by Mr. A. W. Howitt in Gippsland. Following is Mr. Howitt's note on the specimens:—"A Stringybark growing on the clayey flats (post-pliocene?) at Toongabbie near the foot of the hills. Grows to a moderately large tree, say 100 feet. Native name Yangoura." The late Baron von Mueller labelled this specimen "*E. piperita*." It undoubtedly bears the closest resemblance to the Port Jackson and Twofold Bay specimens just referred to. Some of the fruits are a little more ovoid than those of the Port Jackson and Twofold Bay specimens, but that appears to be because they are riper; specimens less mature from the three localities cannot be separated.

We have specimens from near Mittagong, N.S.W., bearing the fruits in a dense head very similar in general appearance to the head-flowering form of *E. eugenioides* figured by us at Fig. 5, Pl. LX. this Journ. 1896. We figure the head and also an individual fruit, and having examined the tree and a complete set of specimens, are of opinion that it belongs to *E. piperita*. At the same time its affinity to *E. eugenioides* is unquestionable. We have seen similar specimens from Port Jackson.

E. piperita and *E. pilularis*.—In the *Eucalyptographia* under *E. pilularis* Mueller lays emphasis on the globular fruits of *E. piperita* in contradistinction to those of *E. pilularis*. The matter is referred to at page 788.

In White's *Journal* (1790), p. 226 is a figure of the "Peppermint tree" referred to as *E. piperita*. The fruits and the twig of leaves (no buds, flowers, etc.) are separate. The fruits figured are "what Mr. White has sent as the ripe capsules of this tree, &c." They belong to the species now known as *E. capitellata*. The description of the tree is "Bark smooth and of a reddish-brown. The leaves are alternate, lanceolate, pointed, very entire, smooth on both sides and remarkably unequal, or oblique at their base; the veins alternate and not very conspicuous. The whole surface of both sides of the leaves is marked with numerous minute resinous spots in which the essential oil resides."

The description of the bark probably refers to *Angophora lanceolata*; that of the leaves probably to *E. piperita*. We say probably because even at the present day it is frequently impossible to identify a species of *Eucalyptus* from description of leaves only. It was published in 1790, and still remains a good model description of a *Eucalyptus* leaf.

E. piperita and *E. amygdalina* have some affinity in regard to the odours of their leaves (owing to the presence of essential oil) which are somewhat similar. *E. piperita* also contains more oil than the generality of species, though much less than that of *E. amygdalina*. The botanical relations of the two species are not close. For a note on the similarity in shape of the fruits of a small-fruited form of *E. piperita* and of *E. amygdalina* var. *radiata* see page 781.

E. piperita and *E. obliqua*.—We mention these two species together because they are so referred to in *Eucalyptographia*, but we would point out that they have really very little in common. Reference to the shape of the buds, the venation of the leaves, and the coarseness of the foliage of *E. obliqua* alone show that the two species have no close affinity.

Range.—North and south coast districts as far north as the Myall Lakes, but the northern limit is uncertain. At Bulladeelah there are many large trees of this species, consequently it is not likely that this place represents its northern boundary.

We have not seen any indubitable *E. piperita* from Queensland.

We have seen plants in the Melbourne Herbarium from the Macleay and Clarence Rivers attributed to *E. piperita*, but they have no fruits and we think the determination is doubtful.

It is found on the Dividing Range and its spurs, being especially plentiful on the Blue Mountains. It is found west at least as far as Mudgee.

The typical form is found at least as far south as Moruya, but trees which are considered to belong to this species occur, as already indicated, as far south as Gippsland.

EUCALYPTUS PILULARIS, Sm.

Vernacular names.—The name “Blackbutt” is of obvious meaning, but sometimes the depth of tint is intensified by bush fires. Before the term “Gum” was restricted to those Eucalypts which have smooth or nearly smooth bark, it was called “Black-butt Gum.” “Flintwood” is an old name for Blackbutt, in allusion to the hardness of the dry wood.

Aboriginal names.—“Yarr-Warrah” of the Illawarra blacks, according to the late Sir William Macarthur. Another N.S.W. aboriginal name was “Benaroon.” By the aborigines of South Queensland it was known as “Tcheergun” and “Toi.”

Bark.—Has fibrous bark on the butt, while the branches are smooth like those of a gum.

Timber.—Pale-coloured. A log usually shows concentric veins, more or less marked, of kino. As a rule these veins are too narrow to cause deterioration of the timber, and their presence affords a useful character for diagnostic purposes. Blackbutt occasionally, though rarely, shows pinholes.

This tree very readily reproduces itself, so much so that when a large one is felled a dense growth of seedlings, growing into straight saplings, is the usual consequence.

Size.—It is one of the largest of our Eucalypts, and giant trees have been recorded over the greater portion of the area in which it abounds.

A tree at Bulli was measured by one of us in 1891 with the following results:—Girth at ground, measuring from buttress to buttress, 57ft. 6in. The girth at 3ft. from the ground was 45ft. and at 6ft. above the ground 40ft. The taper was then very gradual for about 90 feet (estimated), when the head is broken off. There are ten principal buttresses, of an average diameter of over 2 feet, but they practically cease to flute the trunk at a height of 10 to 15 feet.

Mature leaves.—They are often hooked at the tips and sometimes the leaves are glossy. Usually there is no marked difference in the glossiness of the two sides. There are, however, more stomata on the lower side. It would appear that the leaves of southern trees are usually smaller than those from other parts of the colony. The venation is more prominent on the under surface of the leaf. This character, which appears to be almost confined to coast species, is shared by *E. acmenoides*, *E. microcorys* of the *Renantheræ*, and *E. saligna*, *E. resinifera* and several others of the *Parallelantheræ*. The veins are parallel and, unlike most *Renantheræ*, make a considerable angle with the midrib.

Petiole.—Broadish and flattened. Mueller (*Eucalyptographia*) lays emphasis on the flatness of the flower-stalks, but this character belongs to many other species, to some to a greater extent than to *E. pilularis*.

Operculum.—Pointed, even acuminate; sometimes so long as to remind one of that of *E. tereticornis*.

Stamens.—Filaments usually turn red. The dark colour of the stamens has already been referred to in B.Fl. iii. 208. They are, however, not noticed in fresh specimens, but the colour deepens with age.

Fruit.—The fruits vary in size from $\frac{3}{8}$ inch to $\frac{1}{2}$ inch in diameter, and also in the size of the opening.

1. In some trees the fruits are large, $\frac{7}{16}$ inch in diameter and nearly spherical, with but a small opening and a scarcely distinct

rim. This may be taken to be the typical form which led to the adoption of the specific name; it occurs mainly in the Sydney district, not being found much north of Port Jackson and perhaps within a hundred miles to the south.

2. Trees with smaller fruits occur from the Hastings to the Moruya Rivers, and probably along the whole range of the species.

3. In others the fruit has a very large opening, and has a truncate appearance; the rim is comparatively wide. Fruits of this shape occur in Northern New England, on the Hastings, Sea-view Range and south to Moruya; probably also throughout the whole range of the species. Bentham refers to this form when at B.Fl. p. 190, giving a specific character for *E. pilularis*, he states: "Fruit rim usually broad and flat." It is the one figured in the *Eucalyptographia*, and the Baron remarks "the systematic name for this species is not happily chosen." Again (*loc. cit.*) "Whereas the globular fruit of *E. pilularis*, as aptly described in the Linnean Transactions of 1797 would not apply to that species as now understood, but to the *E. piperita* of the present day."

Smith's original description refers simply to "fructu globoso," an expression which is not appropriate to the broad-rimmed forms. Smith's specimens were in all probability collected in the vicinity of Port Jackson and were our form (1), to which the term globular or pilular, as applied to the fruits, is especially appropriate. Bentham and Mueller have been taking cognizance of form (3) which is much more widely diffused than form (1).

As to Mueller's reference to the globular shape of *E. piperita*, we have shown (under *E. piperita*) that this description is not as a general rule quite applicable.

Many of our Eucalypts have large-fruited forms. *E. resinifera*, *E. punctata*, *E. hæmastoma* will occur to many in this connection. *E. pilularis* has one also belonging to the broad-rimmed section. We figure such a form collected by Mr. F. Williams at Dapto some years ago.

Valves.—The valves are sometimes exerted in the broad-rimmed forms. We have fruits from Sydney, Kempsey and Tenterfield which show this well.

Range.—Extending into Queensland on the north and to Moruya on the south, from the coast up the slopes and spurs of the Dividing Range to the Table Land, but apparently not found more than about 100 miles from the coast and scarcely crossing on to the western slope at any place.

We have specimens from the National Park, 20 miles south of Sydney, collected by Mr. Julius Camfield, with the inflorescence in a dense raceme and the fruits large and ovoid, showing, in the latter respect, an approximation to *E. piperita*. The operculum is not as long as that of *E. pilularis* usually is, and the filaments are white although they have been collected for a considerable period. These specimens afford additional evidence of the variability of *E. pilularis*.

In northern New England there is a form of *E. pilularis* the fruits of which are likely to be confused with those of the local Stringybark (a large-fruited *E. eugenoides* verging toward *E. capitellata*). In the latter, however, they are more depressed, have the rim less flat and the valves less prominent, while the buds are angular.

E. ACMENOIDES, Sieb.

Syn. *E. triantha*, Link.

There are two forms:—(a) The typical one. (b) A stout and coarse one which occurs at no great distance from the sea.

Vernacular names.—"White Mahogany," but often erroneously called "Stringybark" because of the similarity in appearance of this species (particularly when young) to Stringybark.

Bark.—Fibrous, not unlike Stringybark in smallish trees; but more like Tallowwood bark (*E. microcorys*) in large trees. The branches are covered as well as the trunk. We would draw attention to the absence of kino in this species. Though we have been on the lookout for it for many years, we have never found a piece much larger than a pin head.

We do not doubt that a good deal of country reported to be Stringybark is really White Mahogany. Both species like the same situations—well drained, sterile hills and mountain sides.

Timber.—Pale-coloured, dense, and of high specific gravity.

Sucker leaves.—The first leaves are opposite and not oblique, but symmetrical, broadly ovate, lanceolate. As the plant grows older they become alternate and are acuminate. The leaves of the coast form are coarse and large, the dimensions of some before us being $2\frac{1}{2}$ to 3 inches broad and 6 inches long.

In the mature leaves there is a tendency to crenulate margins, and some show a considerable resemblance in outline to that of a peach. The leaves are less oblique than in most Eucalypts, and the veins, unlike most *Renanthera*, are parallel, making a considerable angle with the midrib, and are thus very distinct from those of *E. eugenioides*. The twigs are angular.

Buds.—When in a young state, from coast districts, often angular, like *E. capitellata*. The species is often a very profuse flowerer.

Pedicels flattened.

Fruit.—(a) The ordinary form in coastal districts at some distance and elevation from the sea. It is not altogether unlike that of *E. eugenioides*, but is flat at the top with sometimes a thin rim.

(b) Fruits larger and coarser, hemispherical, truncate and with a broad rim. The rim is well defined and usually dark-coloured.

Bentham (B.Fl. iii. 208) doubtfully made this a variety (? var. *acmenoides*) of *E. pilularis*, stating that it sometimes seems to pass into the typical *E. pilularis*. Mueller (*Eucalyptographia*) rightly restores the specific rank of the White Mahogany, although previously (under *E. pilularis*) he had expressed some doubt as to whether *E. acmenoides* and *E. pilularis* are really distinct. But the fruits, the bark, and the character of the timber separate the species very readily. Mueller states that the small capsules figured on the left hand of the *E. pilularis* plate in the *Eucalyptographia* are *E. acmenoides*. It may be so, but the figure is poor.

A form from Parramatta has fruits which might very readily be casually taken for *E. pilularis*. They differ from those of normal *E. pilularis* in being smaller, the rim not defined, and the valves approaching the orifice.

Fruiting twigs of the coast form of *E. acmenoides* may not unreasonably be mistaken for *E. Bosistoana*, F.v.M. The valves of the latter are more numerous than is the case with *E. acmenoides*; the valves of *E. Bosistoana* also are usually a little exserted. *E. Bosistoana* belongs to the Box Group, so that the two trees could not readily be confused in the forest.

The possibility of *E. eugenioides* being confused with *E. acmenoides* has already been referred to.

We have seen a form with brown shining fruits which present a good deal of resemblance in outline to some fruits of *E. melliodora*. This is worthy of notice, though the two species are otherwise very dissimilar.

Range.—Coast districts Central New South Wales to Central Queensland. Occurs in the ranges up to a distance of less than a hundred miles from the coast.

We have not observed it south of Parramatta.

E. SIEBERIANA, F.v.M.

The species referred to as *E. virgata*, Sieb. (B.Fl. iii. 202) in part. We would suggest consideration of our remarks on this subject in Part iii. of our series (Proc. Linn. Soc. N.S.W. ii, 717).

Vernacular names.—"Mountain Ash" is its usual name. It attains its greatest luxuriance in mountain districts and its timber is thought to resemble Ash. Sometimes called "Black Ash," but this name should be reserved for *E. stellulata*. In Tasmania and at Wilson's Promontory, Victoria, it is sometimes called "Gum-top" or Gum-top Stringybark (in allusion to the smoothness of the tops of the branches) and White-top Ironbark in Tasmania, where there are no true Ironbarks. It has been also called Blackbutt, but that name should be reserved for *E. pilularis*. It was called "Yowut" in the Gippsland district, according to Howitt. It has been called "Messmate" or

“Stringybark” at the Dromedary, N.S.W., but the use of such names for this species is to be deprecated.

Bark.—In young trees the bark often somewhat resembles “Stringybark” when viewed from a little distance. Hence the tree has been sometimes called Stringybark with a qualifying adjective. In older trees the bark becomes denser, darker coloured, more furrowed and rugged in character. The casual observer might be excused if he took the tree for an “Ironbark,” but a closer examination would show the bark to be neither dense nor tough enough. The small branches are smooth.

The smooth bark of saplings appears always to be glaucous.

Timber.—Pale-coloured and fissile, less variable perhaps than that of most of the Eucalypts. Very suitable for inside work, but not durable when not protected from the weather.

Seedling leaves.—Opposite in the first stage, soon becoming alternate, elliptical in shape and soon becoming shortly pointed. The sucker leaves similar in character. Seedling and sucker leaves are glaucous, dull-coloured on drying and have the veins more spreading than is the case in the mature foliage.

Mature leaves.—The leaves are often smooth, shining and coriaceous.

We observed a narrow-leaved form both at the Sugarloaf Mountain (Braidwood) and at the Dromedary. Tasmanian specimens appear to have longer, narrower and more falcate leaves. There is a broad-leaved and very glaucous form in the Snowy Mountains.

The venation is spreading, as brought out in the drawing.

Leaves from Mt. Wilson in the west and Barber’s Creek in the south are hooked; probably this will be found to be no unusual character.

Buds clavate.

Operculum.—Hemispherical or slightly umbonate. Pale-coloured opercula are often observed in the Blue Mountains. Double opercula sometimes occur in this species.

Inflorescence.—Frequently ocellate; this is often a useful guide in distinguishing this from allied species.

Fruits.—Pear-shaped, usually a little oblique, the rim sometimes slightly concave, particularly when ripe. Edge of rim frequently sharp. Sometimes the plane of the rim is not at right angles to the axis of the fruit. Shining. The rim usually well defined and often dark as in *E. haemastoma*.

The fruit is more hemispherical in Tasmanian specimens.

Apparently the fruits attain their largest size on the Blue Mountains. It would appear that the fruits of *E. Sieberiana* from New South Wales are usually more pear-shaped and larger than those represented in the *Eucalyptographia*.

Range.—Tasmania, Victoria, and in our own colony, chiefly the coast districts. It, however, occurs in the Snowy Mountains (near the Victorian border) at an elevation of 4-5000 feet, and thence northward along the ranges, west at least as far as Mudgee. Mr. A. R. Crawford, of Walcha, (a valued correspondent) states that it occurs in New England, and knowing his experience in such matters we attach weight to his statement, but his specimens have miscarried and it has not been convenient to him to replace them, as they were procured 40 miles from his home.

On the Snowy Mountains it is interesting to observe that *E. Sieberiana* is always found on slopes with a southern aspect.

The species loves high, rocky, stony mountain ranges on poor barren ground, and never takes to grassy localities.

We have a specimen of "Mountain Ash" marked as being collected by Mr. W. S. Campbell near Molong; the timber is not dissimilar to that of normal *E. Sieberiana*; the venation of the leaves has the character of *E. haemastoma* or *E. Sieberiana*, but the fruits (we have neither buds nor flowers at present) are almost spherical, being truncate at the top.

Mueller, in *Eucalyptographia*, speaking of *E. Sieberiana* and *E. haemastoma*, states that "the stem bark of the former is far more ridged than that of the latter, the veins of the leaves of *E. Sieberiana* are less spreading and less prominent, while the fruit is usually longer, more exactly semiovate and never verging towards an hemispheric form." In regard to these statements

we would observe that *E. hamastoma* is a smooth-barked tree, and that those rough-barked trees which were thought to show some transition towards *E. Sieberiana* (as well as to other species) have since been shown to belong to other species.

The Sydney form is often confused with *E. hamastoma*, as the young trees often have the appearance of white gum if the butts be not carefully examined.

If *E. Sieberiana* leaves be crushed in the warm hand they evolve a slight odour of peppermint which is not observable in *E. hamastoma*.

In the *Flora Australiensis* Bentham also draws attention to the affinity between *E. Sieberiana* and *E. hamastoma*, and lays some stress on the differences between their anthers. We are of opinion that it is difficult, and perhaps impossible, in the present state of our knowledge, to distinguish the two species by means of their anthers.

As regards the shape of the fruit, our specimens of *E. Sieberiana*, reputedly from Molong, those of Mr. Howitt from Gippsland, and some from Tasmania (L. Rodway) distinctly are almost hemispheric in form, but they are very distinct from those of *E. hamastoma*.

E. coriacea.—Both Bentham and Mueller compare *E. Sieberiana* and *E. coriacea*. The closest similarity appears to be in the shape of the fruits. For fruits of *E. coriacea* see Proc. this Soc. 1895, Pl. LIV., figs. 4-6. They are coarser and more fleshy than those of *E. Sieberiana*; the coarse, fleshy, spread veins of *E. coriacea* are also characteristic and quite different from those of *E. Sieberiana*. In addition, *E. coriacea* is a smooth-barked tree, while *E. Sieberiana* is rough-barked.

E. SIEBERIANA, var. OXLEYENSIS, var. nov.

To commemorate the connection of Oxley with Mt. Seaview (where the tree is abundant).

We now come to a tree undoubtedly connected with *E. Sieberiana*, and rather extensively distributed in the northern districts. It may perhaps be looked upon as the northern representative of *E.*

Sieberiana. If not a distinct species it is undoubtedly a well-marked variety which extends unchanged over a considerable area, and for which we propose the provisional name of var. *Ocleyensis*

The possession of absolutely complete material may prove that it is worthy of specific rank.

It is the tree referred to in the following passage in Maiden's Dorrigo Report in *Agric. Gaz.*, Oct., 1894, p. 612:—

“Less than 100 yards inside the brush of the Glenfernie Forest Reserve, and at least as far as Blick's River to Bald Hills, is a large tree, with brown, peppermint-like bark, which seems to be intermediate in character between *E. haemastoma* and *E. Sieberiana*. The tree would appear to be very widely distributed in New England, for specimens collected by Mr. Henry Deane, at the Bluff River, near Tenterfield, cannot, in my opinion, be separated from my specimens. Of course the typical *E. Sieberiana*, with bark of the appearance of an ironbark, free-grained timber, and conoid fruits (with pedicels hardly separable from the fruits), is at once distinguishable from the smooth-barked *haemastoma*, usually of crooked growth, inferior timber, and with the fruit having a tendency to a hemisphere, leaving a distinct pedicel. But my specimens seem to be intermediate in character. The peppermint-like (*E. piperita*) bark is very different in appearance to that of the true *E. Sieberiana*, and while the veins of the leaves of *E. Sieberiana* are usually less conspicuous than those of *E. haemastoma*, I cannot satisfy myself to bring the leaves of my plants into one species rather than into the other. To sum up, having considered the fruits, leaves, barks, and timbers, I can only observe that my particular New England specimens (called by the few local residents ‘messmate’ and ‘peppermint’ indiscriminately), must for the present be looked upon as a connecting-link between *E. haemastoma* and *E. Sieberiana*.”

It is the tree referred to under *E. Sieberiana* in the *Proc.* of this Soc. for 1898, p. 27.

Similarities to E. Sieberiana.—Has every appearance as regards buds, flowers and fruits, of a slender form of *E. Sieberiana*.

Dissimilarities to E. Sieberiana.—In bark and timber.

Vernacular names.—“Messmate” appears to be the local designation most generally in use, but it has been called Peppermint with reference to the appearance of the bark alone.

Bark.—Resembles that of *E. amygdalina* or *E. piperita*, more than that of *E. Sieberiana*. It is not furrowed like that of the latter species. In fact it is not at all like *E. Sieberiana*, its bark being sometimes particularly fibrous. Only the smaller branches are smooth.

Timber.—Very different to that of *E. Sieberiana*, being of a deep brown colour. At the same time it is a duller-looking timber, and is looser in the grain and not so long in the fibre as that of *E. Sieberiana*.

Fruits.—Much smaller and more slender than those of *E. Sieberiana*. In some cases the pedicels are much slenderer and the calyx-tube more rounded at the base than in others. Such fruits bear some resemblance to those of *E. hamastoma*, var. *micrantha*, but the smooth bark of the latter tree at once establishes a difference between the plants.

Leaves.—The sucker leaves do not appear to be dissimilar to those of *E. Sieberiana*. As regards the mature leaves, they are often long and narrow, leaves that are 6 inches in length being commonly not more than five-eighths of an inch in width.

Size.—Four or five feet in diameter and 100 feet high as seen.

Range.—Northern New England (Tenterfield district); the Dorrigo country (head waters of the Bellinger); Mt. Seaview and adjacent mountains; Upper Hastings River. It is so abundant in the above localities that it will probably be found to be distributed over the greater part of the tablelands and coast ranges of the north-east of the colony from the Manning River northwards.

E. PLANCHONIANA, F.V.M.

This is one of the less known of New South Wales Eucalypts. It bears the largest fruit of any of our species, the shape of the fruit being ovoid, with raised longitudinal ribs. It is a coast

species, and we are not aware that it has been recorded from further south than Camden Haven. It extends along the coast as far as Queensland. At Camden Haven it is found over an area of about a mile by half a mile broad, and is locally known as Stringybark, but it is more like Red Mahogany. The bark is rough to the ultimate branchlets. The trees are poor and pipy; a solid one could not be found. Their height goes up to (say) 30 feet, with a diameter of 15 inches, but the trees are of stunted growth and their occurrence is patchy. We have seen a fruit from Camden Haven $1\frac{1}{8}$ inch broad by 1 inch deep. Near Kempsey *E. Planchoniana* is a fine tree, resembling *E. robusta* in bark, and attaining a height of (say) 100 feet and a trunk diameter of 3 feet.

The following are some Notes which supplement those given on the species of Eucalyptus already dealt with by us:—

E. OBLIQUA, L'Herit.

[Previous reference, 1896, 803.]

Another Kew gardener, David Nelson, was Assistant Botanist during Cook's third voyage, 1776-1779. L'Heritier founded the famous genus *Eucalyptus* on *E. obliqua*, first found by Nelson in Van Diemen's Land, and introduced into cultivation by Captain Furneaux in 1774 (*Pharm. Journ.* 19th Decr., 1896, p. 531.)

The following letter is interesting, not only because it brings the recorded localities of the species some miles to the west, but because it embodies other experiences of a well-known observer:—
“The Eucalypt mentioned by you (*E. obliqua*) is abundant here. In this locality it is found on poor stony ranges chiefly. It attains a great size, up to 8 or 9 feet or even more in diameter; such trees are usually short-stemmed. It is said it will not last as posts, but I have never been given satisfactory proof as to its unfitness. A mile or two of fence is erected; the posts are mixed, probably split from three or four different kinds of Stringybark. Then 12

or 15 years later, who can say which is best? Certainly not the average bushman. It is often, I know, too short to run into rails. I have seen trees that you could not run into 7 foot posts even if struck 6 inches thick. I split a tree of this species 85 feet in length of barrel by 2 feet in diameter; it flowered here last season in January, the trees being great masses of bloom, very noticeable, although distant on the ranges from one to two miles. It is known here as Woolly-butt, Woolly-bark, or White Stringybark" (A. R. Crawford, Moona Plains, Walcha, July, 1898).

E. DEXTROPINEA and E. LEVOPINEA, Baker, in P.L.S.N.S.W.,
1898, p. 414.

We have not had a sufficient opportunity of examining these trees, although we have been favoured with herbarium specimens by Mr. Baker, and therefore hesitate to pronounce any strong opinion as to their affinities. Mr. Baker places them both among the "Stringybarks." It seems, however, to us that *E. dextropinea* has some characters in common with *E. pilularis*, and we think it is a pity that the chemical products of that species had not been inquired into before naming the two new ones. We must, however, offer our protest against naming species after recondite properties which can only be recognised after close analysis in the laboratory.

E. STELLULATA, Sieb.

[Previous reference, Vol. (2) x. 596.]

At page 597 we stated that we were in doubt as to the meaning of the term Muzzlewood as applied to this species. We have ascertained that on account of its toughness it is often selected for making muzzles for unweaned calves.

For some notes on the sucker-leaves of this species, see Proc. Aust. Assoc. for Adv. Science, vii., 538.

E. CORIACEA, A. Cunn.

[Previous reference (2) x. 598.]

For some notes on the seedling leaves of this species, see Proc. Aust. Adv. Science, vii., 538.

E. AMYGDALINA, Labill, var. *LATIFOLIA*, Deane and Maiden.

[Previous reference (2) x. 609.]

Abundant on Black Range (Mt. Victoria to Jenolan Caves). It is common also in the Goulburn district.

E. REGNANS, F.V.M.

The giant tree at Mt. Tomah, which has been recently measured by one of us, is of this species. Diameter at ground, 17 feet, 6 inches; 3 feet up, 16 feet, 3 inches; height (estimated), 150 feet.

For some notes on *E. regnans*, see Proc. Aust. Assoc. Adv. Science, vii., 539.

E. EUGENIOIDES, Sieb., var. *NANA*, nobis.

[Previous reference, 1896, 803.]

In exposed situations in the Blue Mountains a dwarf, mallee-like growth of Eucalyptus grows. The species is mainly *E. stricta*, sometimes admixed with a little *E. stellulata*, var. *angustifolia* in swampy places. On the King's Tableland, Wentworth Falls, we found a form of *E. eugenioides* which bears a remarkable resemblance to *E. stricta*, and in reference to its dwarf habit we style it var. *nana*.

This is the first occasion in which we have found this species to form part of the dwarf gum-scrub in question.

It bears a strong resemblance to *E. stricta*, unless the inflorescence and fruits be examined; and we trust that the figures, aided by the following notes, will make the identity of this interesting plant quite clear:—

Sucker leaves.—Lower leaves almost cordate and very symmetrical. As growth proceeds they become ovoid and finally lanceolate. The lower cordate leaves about $\frac{3}{4}$ inch long by $\frac{1}{2}$ inch broad.

Mature leaves.—Thicker, and, as a rule, more symmetrical than those of the normal species. Narrow, lanceolate, those 2 inches in length (which is the normal length) being usually $\frac{1}{2}$ inch across. Some of the leaves are proportionately so narrow as to come within

the designation of linear-lanceolate, which is, we believe, a very unusual circumstance in this species.

Fruits.—In shape not dissimilar to those of the normal species, but rather smaller in size.

Each individual fruit about $\frac{7}{32}$ of an inch in diameter; the whole packed into a head (consisting usually of 7 to 9 fruits) about half an inch in diameter. For figure of another head-fruited form of *E. eugenioides*, see No. 5, Pl. LX. 1896.

Height.—5 or 6 feet, forming a dense scrubby growth.

Range.—Although we have only found it at King's Tableland, Wentworth Falls, we think it very likely that further search will reveal its presence in other exposed situations on the Blue Mountains.

With reference to the normal species, Mr. H. A. Lowe, a well-informed correspondent, writes under date 10th February, 1898: "I have a post and rail fence of this timber which has been erected for 52 years, and the greater part of the fence is still in first-rate order."

E. STRICTA, Sieb.

[Previous reference, 1897, 708.]

This species is figured in *Bot. Mag.* t. 7074.

EXPLANATION OF PLATES.

Plate XXIX.

Eucalyptus piperita, Sm.

- Fig. 1.—Seedling leaf, Sydney district.
 Fig. 2.—Sucker-leaf, Sydney district.
 Fig. 3.—Mature leaf showing oblique venation, Blue Mountains.
 Fig. 4.—Fruits: (a) urceolate; (b) egg-shaped; (c) spherical; (d) from tree, intermediate in character between *E. piperita* and *E. eugenioides*; (e,f) head-fruited form, from near Mittagong, N.S.W.

E. pilularis, Sm.

- Fig. 5.—Fruits: large pilular fruits, common in Sydney district.

Plate xxx.

E. pilularis, Sm.

- Fig. 6.—Fruits of intermediate size, from Hawkesbury River.
 Fig. 7.—Fruit of small form from Port Macquarie.
 Fig. 8.—Ovoid fruits, National Park, Sydney, showing transition to *E. piperita*.
 Fig. 9.—Fruits from Kogarah Bay, Sydney, showing narrow rim and exerted valves.
 Fig. 10.—Fruits from Tenterfield district, showing broad rim and exerted valves.
 Fig. 11.—Large-fruited, broad-rimmed form, from Dapto.

E. acmenoides, Schau.

- Figs. 12-14.—Large and small sucker-leaves (from same twig); also mature leaf. All from Middle Harbour, Sydney, and from the coarse form of the species.

Plate xxxi.

E. acmenoides, Schau.

- Fig. 15.—Fruits: (a) Manly, Sydney (coarse coast form); (b) Berowra, Hawkesbury (coarse coast form); (c) Mt. Seaview (slender inland form); (d) Tinonee, Manning River (slender inland form); (e-f-g) Woy Woy, Wyong, Stroud. The last three are forms intermediate between the coarse ones of the coast and the slender inland ones.

E. Sieberiana, F.v.M.

- Fig. 16.—Seedling leaf, Barber's Creek, N.S.W.
 Fig. 17.—Sucker-leaf, Barber's Creek, N.S.W.
 Fig. 18.—Mature leaf, showing spreading venation. Blue Mountains, N.S.W.

Plate xxxii.

E. Sieberiana, F.v.M.

- Fig. 19.—Fruits: (a) Hill Top, Mittagong, N.S.W.; (b) Snowy Mountains, N.S.W.; (c) Mt. York, Blue Mountains; (d) Mt. Wilson.

E. Sieberiana, var. *Oxleyensis*, nobis.

- Fig. 20.—A small narrow leaf.
 Fig. 21.—Slender fruits (usual form in this variety), near Tenterfield.
 Fig. 22.—Fruits more rounded at the base than is usual in this variety, Seaview Range.

Plate xxxiii.

E. eugenoides, Sieb., var. *nana*, nobis.

The Plate is mainly self-explanatory. The twig is part of a young sucker. The detached leaves are various stages and forms of sucker-leaves.